

### REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-26 are pending in the present application, Claims 1, 3, 4, 6-12, and 14-19 having been amended by the present amendment, and support for the amendments is found in original Claims 1, 3, 4, 6-12, and 14-19. Additional support for amended Claim 1 is found on page 18, lines 9-14 of the specification. It is respectfully submitted that no new matter is added by this amendment.

In the outstanding Office Action the drawings, specification, and Abstract were objected to; the claims were objected to as lacking a proper introduction; Claims 1, 3, 4, 6-12, and 14-19 were objected to as including minor informalities; Claim 7 was objected to under 35 U.S.C. §112, second paragraph, as indefinite; Claims 1 and 26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kim et al. (U.S. Patent No. 6,615,385 B1, hereinafter Kim) in view of Yi (U.S. Patent No. 5,907,582); Claims 2-5 and 25 were rejected under U.S.C. § 103(a) as being unpatentable Kim as applied to Claim 1 and further in view of Haller et al. (U.S. Patent No. 6,182,261, hereinafter Haller); Claims 6, 9, 11, and 12 were rejected under U.S.C. § 103(a) as being unpatentable Kim in view of Yi as applied to Claim 1, and further in view of Zhang et al. (U.S. Patent No. 6,233,709, hereinafter Zhang); Claims 7 and 10 were rejected under U.S.C. § 103(a) as being unpatentable Kim in view of Yi and Zhang as applied to Claim 6, and further in view of Siemens (WO 99/11009); and Claims 8 and 13-24 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all limitations of the base claim and any intervening claims.

Applicants thank Examiner Deppe for the early indication of allowable subject matter in Claims 8 and 13-24. However, since the Applicants believe amended Claim 1 is patentably distinguishable over the cited references as discussed below, Claims 8 and 13-24 have been maintained in dependent form.

The specification, Abstract, and Claims 1, 3, 4, 6-12, and 14-19 are amended to correct the minor informalities listed in paragraphs 5-9 of the outstanding Office Action. Further, substitute Figures 1-2 are submitted herewith amending Figures 1 and 2 consistent with the Examiner's suggestions in paragraphs 2-4 of the outstanding Office Action. Accordingly, it is respectfully requested that the objections to the specification, Abstract, Claims 1, 3, 4, 6-12, and 14-19, and Figures 1 and 2 be withdrawn.

Claim 7 has been amended to delete the language objected to in paragraph 11 of the outstanding Office Action. Therefore, it is respectfully requested that the rejection to Claim 7 under 35 U.S.C. §112, second paragraph, be withdrawn.

Briefly recapitulating, the digital transmission method with error correcting coding as in amended Claim 1 includes a "generating a characteristic quantity from each set of said weighted output information items generated by each of said elementary decoding steps during each iteration that is characteristic of said set of weighted output information items," and "determining a threshold quantity characteristic of said decoding." The characteristic quantity is then compared with a threshold quantity and the iterative decoding is interrupted when the characteristic quantity reaches the threshold quantity.<sup>1</sup> As a result of generating the characteristic quantity from each set of weighted output information generated by each elementary decoding step, the iterative decoding method can be interrupted at an elementary decoding step within each iteration as soon as a desired result is reached because successive

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<sup>1</sup> Applicants' specification at least at page 8, lines 27-30.

elementary decoding steps are not required to calculate the characteristic quantity that is compared to the threshold quantity.<sup>2</sup> The transmission efficiency of the method is also increased since the characteristic quantity is generated after transmission.

Kim is directed towards an iterative decoder and decoding method in which the output of each component decoder is checked for the presence or absence of errors.<sup>3</sup> Kim discloses a Cyclic Redundancy Code (CRC) check for determining the presence of errors after each component decoder.<sup>4</sup> A CRC must be introduced on transmission, which reduces the overall efficiency of the channel coder. Further, Kim discloses error checker 190 and states that error checker 190 may be a CRC checker, but does not disclose how the error checker would operate if it was not a CRC checker.<sup>5</sup> Further, Kim only discloses that the error checker provides a hard decision output depending on whether or not errors are detected based on the soft signal values from the decoders.<sup>6</sup> Kim does not disclose that the error checker determines or uses a threshold quantity. Therefore, Kim does not teach or suggest “determining a threshold quantity characteristic of said decoding,” as recited in amended Claim 1.

Further, amended Claim 1 recites “generating a characteristic quantity from each set of said weighted output information items generated by each of said elementary decoding steps.” The characteristic quantity in amended Claim 1 is generated from each set of weighted information items generated during decoding, and therefore, the characteristic quantity is generated after transmission. The CRC transmitted over a channel in Kim is not generated “from each set of said weighted output information items generated by each

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<sup>2</sup> Applicants’ specification at least at page 17, lines 5-10.

<sup>3</sup> Kim, column 2, lines 13-20.

<sup>4</sup> Kim, column, Figure 3.

<sup>5</sup> Kim, column 4, lines 4-6.

<sup>6</sup> Kim, column 5, lines 5-17.

elementary decoding step,” since at the very least the CRC is generated prior to transmission, reception, and decoding. Thus, the CRC of Kim is not equivalent to the characteristic quantity generated after transmission. Therefore, Kim does not teach or suggest every element of the amended Claim 1.

Yi is directed towards a digital audio broadcasting (DAB) system adapted to broadcast signals of digital radio information and to reduce multipath fading, signal shadowing, and temporal blockage.<sup>7</sup> For example, a first turbo encoded broadcast signal is transmitted on a first path to a first satellite and a second turbo encoded broadcast signal is transmitted on a second path to a second satellite, wherein the first turbo encoded broadcast signal consists of uninterleaved data and parity check elements and the second turbo encoded broadcast signals consists of interleaved data and parity check elements.<sup>8</sup> The first and second turbo encoded broadcast signals are then received by RAKE receivers that demultiplex the first and second turbo encoded broadcast signals using successive iterations. Yi fails to disclose “determining a threshold quantity characteristic of said decoding,” generating a characteristic quantity during each iteration, “comparing said characteristic quantity with said threshold quantity,” and “interrupting said decoding when said characteristic quantity reaches said threshold quantity.”

Therefore, it is respectfully submitted that neither Kim nor Yi, either alone or in a proper combination, teach or suggest “determining a threshold quantity characteristic of said decoding” that is used for “interrupting said decoding when said characteristic quantity reaches said threshold quantity.”

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<sup>7</sup> Yi, column 4, lines 26-35.

<sup>8</sup> Yi, column 4, lines 35-65.

The outstanding Office Action states on page 7, line 20 to page 8, line 2, that "since Kim et al. does not provide details of the Turbo encoder, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the receiver of Kim et al. in a communication system with the transmitter/encoder of Yi in order to recover turbo coded data without incurring undue processing delay."

Applicants respectfully traverse the obviousness rejection based on the Kim and Yi patents because there is insufficient evidence for a motivation to modify the DAB system of Yi by incorporating the error checker of Kim, for the following reasons.<sup>9</sup>

The record fails to provide the required evidence of a motivation for a person of ordinary skill in the art to modify Yi with the error checker of Kim. While the Kim patent may provide a reason for using an error checker in a DAB system, Kim fails to suggest why a person of ordinary skill in the art would be motivated to incorporate an error checker in the DAB system of Yi. Further, Kim does not suggest that error checker would work in a DAB system of Yi.

Kim and Yi, therefore, do not provide the motivation to perform the proposed modification of the DAB system of Yi. In other words, an attempt to bring in the isolated teaching of the error checker of Kim into the DAB system of Yi would amount to improperly picking and choosing features from different references without regard to the teachings of the references as a whole.<sup>10</sup> While the required evidence of motivation to combine need not

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<sup>9</sup> See MPEP 2143.01 stating "[o]bviousness can only be established by combining or modifying the teaching of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art," (citations omitted). See also MPEP 2144.08 III stating that "[e]xplicit findings on motivation or suggestion to select the claimed invention should also be articulated in order to support a 35 U.S.C. 103 ground of rejection. . . . Conclusory statements of similarity or motivation, without any articulated rational or evidentiary support, do not constitute sufficient factual findings."

<sup>10</sup> See In re Ehrreich 590 F2d 902, 200 USPQ 504 (CCPA, 1979) (stating that patentability must be addressed "in terms of what would have been obvious to one of ordinary skill in the art at the time the invention was made in view of the sum of all the relevant teachings in the art, not in view of first one and then another of the isolated

come from the applied references themselves, the evidence must come from *somewhere* within the record.<sup>11</sup> In this case, the record fails to support the proposed modification of the DAB system of Yi.

The position that the DAB system of Yi can be modified to arrive at the digital transmission method of amended Claim 1 is insufficient to establish a *prima facie* case of obviousness.<sup>12</sup>

Therefore, it is respectfully submitted that neither Kim nor Yi, either alone or in any proper combination, do not teach or suggest the digital transmission method of amended Claim 1. Accordingly, it is respectfully requested that the rejection of Claim 1 under 35 U.S.C. §103(a) be withdrawn. Further, cited references Haller, Zhang, and Siemens have been considered, but Haller, Zhang, and Siemens fail to cure the deficiencies of Kim and Yi as discussed above with respect to amended Claim 1. Accordingly, it is respectfully requested that the rejection of Claim 1 under 35 U.S.C. §103(a) be withdrawn.

Likewise, it is also respectfully submitted that Claims 2-26 are also allowable based at least on the dependent recitation of the above identified features of amended Claim 1. Accordingly, it is also respectfully requested that the rejections to dependent Claims 2-7, 9-13, 25, and 26 under 35 U.S.C. §103(a) also be withdrawn.

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teachings in the art," and that one "must consider the entirety of the disclosure made by the references, and avoid combining them indiscriminately.")


<sup>11</sup> *In re Lee*, 277 F.3d 1338, 1343-4, 61 USPQ2d 1430 (Fed. Cir. 2002) ("The factual inquiry whether to combine references ... must be based on objective evidence of record. ... [The] factual question of motivation ... cannot be resolved on subjective belief and unknown authority. ... Thus, the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion").

<sup>12</sup> See MPEP 2143.01 stating that the "fact that references can be combined or modified is not sufficient to establish *prima facie* obviousness"; see also same section stating "[a]lthough a prior art device 'may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so,'" (citation omitted).

Consequently, in view of the present amendment and in light of the above discussion, the application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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IN THE DRAWINGS

The attached two drawing sheets include changes to Figs. 1 and 2 to correct minor informalities. These sheets, which include Figs. 1 and 2, replace the original sheet including Figs. 1 and 2.

Attachment: Replacement Sheets (2).